greatest in patients with the largest infarcts. Further, patients older than 60 years of age had a much greater tendency to remodel than younger patients.

COMPUTED TOMOGRAPHY

Noninvasive coronary angiography has long been one of the holy grails of non-invasive imaging. Two studies (17,18) reported the initial experience with coronary angiography obtained with 16-slice computed tomography and demonstrated the feasibility of delineating stenosis in vessels as small as 1.5 mm. Using conventional cineangiography as a gold standard, both groups demonstrated sensitivities of 88% to 90% and specificities of 90% to 95%. A representative image provided by Dr. Schroeder (17) is shown in Figure 3.

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Valvular Heart Disease

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Valvular heart disease was the focus of many exciting presentations at the American College of Cardiology Scientific Sessions in 2003. Traditional concepts related to "degenerative" native and prosthetic valve disease are being challenged, our surgical approaches are improving, and we are beginning to see over the horizon at the possibilities for percutaneous approaches to valve replacement and repair.

The role for cholesterol and inflammation in the development of calcific aortic stenosis (AS) continues to evolve. An estimated 2% to 9% of the elderly have calcific AS (1,2), and they share both similar risk factors with those suffering from atherosclerosis (3,4) and pathophysiologic mechanisms that result in calcification (5). Of the many abstracts investigating this, Fondard et al. (6) presented evidence for an increase in matrix metalloproteins in AS. Matrix metalloproteins are proteolytic enzymes that lead to the degradation of the extracellular matrix; overexpression has been associated with a variety of processes, most notably osteoarthritis (7). That tumor necrosis factor (TNF)-alpha may

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also be implicated was suggested by Kaden et al. (8). In this latter study, explanted aortic valve cells grown in culture treated with TNF-alpha resulted in an increase in the expression of osteoblast-associated genes and calcification.

There remains hope that medical therapy may slow the progression of, or prevent, AS. A recent editorial in the *Journal* addresses the issue (9). The AS valvular tissue harbors chronic infiltrations of macrophages, T lymphocytes, low-density lipoproteins, lipoprotein(a), osteopontin (a mediator of calcification), angiotensin-converting enzyme (ACE), and angiotensin II (10). Retrospective studies (11–15) have provided encouraging results regarding the effects of statins. However, in another retrospective echocardiographic study (16), 95 patients with AS on statins were compared with a similar AS cohort not on statins at a mean follow-up of 51 months, and no difference in the rate of change of the valve gradient, aortic valve area, symptoms, or need for aortic valve replacement (AVR) was found between the groups. Because ACE has been identified in AS valvular lesions, Olsen et al. (17) reviewed the effect of losartan compared with atenolol in 960 patients randomized in the Losartan Intervention for Endpoint reduction in hypertension (LIFE) study. Unfortunately, AS progressed regardless of the treatment arm.

There were many interesting surgical presentations regarding valvular disease. What to do with the mitral regurgitation (MR) in patients undergoing isolated AVR was addressed by Diodato et al. (18). In a retrospective echocardiographic review, with a mean follow-up of 16 months after AVR, the MR often persisted regardless of the baseline severity. The authors concluded that even mild to moderate MR should be repaired at the time of AVR, though no other supportive evidence was presented in this regard.

The risk associated with MR surgery in patients undergoing coronary artery bypass graft surgery (CABG) was reviewed using the Society of Thoracic Surgery's database (19). The 30-day data from 4,137 patients with an ejection fraction ≤35% and associated MR revealed that mortality for CABG alone was 9.2%. Mortality from CABG plus mitral annuloplasty was 8.4%, CABG plus mitral repair was 7.7%, and CABG plus mitral valve replacement (MVR) was 14.3%. Thus, in these patients, mitral annuloplasty or repair added no additional risk to CABG, but MVR worsened early survival. Longer term follow-up data were not presented.

There remains an interest in novel prosthetic material for valve replacement. In a study of 11 patients undergoing the Ross procedure (20), excellent hemodynamic results using a tissue-engineered valve in the pulmonic position were reported. Four weeks before surgery, forearm or saphenous venous cells were harvested and grown in a tissue laboratory. These cells then seeded a decellularized pulmonary allograft coated with basal membrane glycoproteins. The patients were followed for two years with no evidence for early pulmonary homograft restenosis found.

Finally, Cribier et al. (21) reviewed the data that led to the first human percutaneous AVR reported in 2002 (22) describing two additional patients in whom the procedure had been successful. The valve consisted of three bovine pericardial leaflets mounted into a stainless steel balloon expandable stent. A different approach taking advantage of the valve in the bovine jugular vein has been described by Boudjemline and Bonhoeffer (23).

Percutaneous approaches to MR were the subject of a session with Drs. Pandian and Fitzgerald. They noted that Dr. Jose Candado from Venezuela had successfully performed the first human insertion of a coronary sinus MR reduction device.

In summary, the pathophysiology of what is traditionally considered "degenerative" aortic valve disease remains of great interest. The desperate need for appropriately designed and executed randomized trials to investigate treatment options, such as statins and ACE inhibitors, remains obvious given the mixed results of retrospective trials. When AVR is being performed, the presence of associated MR may warrant concurrent repair. When CABG is performed in patients with poor left ventricular function and MR, mitral repair or annuloplasty does not add to early mortality, but MVR does. Tissue-engineered valves appear promising, at least when used in the pulmonary position in the Ross procedure. And finally, the meetings provided the first glimpse for the attendees at the possibilities for percutaneous valve replacement and repair.

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Cardiac Function and Heart Failure

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I had the pleasure working with Drs. Jonathan Abrams, Howard A. Cohen, Sudhir S. Kushwaha, and Eric S. Williams to develop the specific contributions in the broad field of cardiac function and heart failure to be presented as original work at these Scientific Sessions. With the assistance of other highly respected reviewers, 1,143 abstracts were graded for selection for only 351 allotted slots on the overall program. As such, many highly ranked abstracts were not able to be accepted for presentation. The accepted abstracts were then assigned into thematically grouped sessions. Although it is impossible to cover the content of these original contributions, a brief overview of the titles of these sessions provides some insight into the active areas of investigation.

There were several sessions devoted to cardiomyopathies with specific sessions for hypertrophic, dilated, and restricted cardiomyopathies. The Program Committee also had one session termed miscellaneous cardiomyopathies. This does not indicate that the Program Committee identified a new form of cardiomyopathy, but does demonstrate that there were many highly ranked abstracts on the issue of cardiomyopathy that did not quite fall into one of the easily recognized clinical patterns. Myocarditis continues to be an important area of investigation.

Contributions concerning cardiac transplantation produced several high-quality sessions concentrating on clinical prognostic factors for both short-term rejection and allograft vasculopathy. It is noteworthy that two entire sessions were devoted to the left ventricular assist device, providing a flavor of the advances in this field in managing these highest risk patients.

A substantial proportion of the accepted presentations concentrated on the interface of cardiac function, heart failure, and the elderly. There were particular sessions devoted to physiologic alterations, coronary syndromes, and specific risk factors for failure in the elderly as well as the risk/benefits of pharmacologic therapy in this important segment of our population. My favorite session topic was entitled "Hazards of Being Elderly." Although I did not attend the specific session, I was assured that an American Association of Retired Persons card was not required for admission.

The number of abstract submissions and acceptances concerning heart failure with preserved systolic function indicates that this is a clear investigative growth area. Exercise testing as well as exercise training continue to be important investigative and therapeutic areas. Contributions concerning ventricular remodeling continue to provide mechanistic underpinnings for a broad range of areas of cardiac function and heart failure. The prognostic importance of old standards, such as assessments of left ventricular as well as right ventricular ejection fractions, was emphasized in several sessions concerning outcomes of patients with heart failure.

The added prognostic value of a determination of B-type natriuretic peptide (BNP) levels was a clear theme across a strong group of accepted abstracts. Important contributions

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